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**Edgar F. Borgatta, George W. Bohrnstedt
Editors**

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SOCIOLOGICAL METHODOLOGY 1970

The question of what to do and how to do it in sociological investigation and analysis is as open to innovation and change today as it ever was. In a field that studies a subject about which it can never be said, "This is final," styles and trends develop as rapidly as new information is discovered. *Sociological Methodology 1970* is the second annual yearbook in a series sponsored by the American Sociological Association to advance the development of methodology in sociology and to keep the social scientist abreast of the methodological changes in his field. Borgatta and Bohrnstedt have put together a collection of original essays that touch upon the most current topics in the field and give a representative sampling of the thinking of its leading spokesmen.

OF SPECIAL INTEREST

No one methodological area dominates the 1970 yearbook, but several aspects of the book deserve special mention. Chapters by *Heise, Pelz, Lew, and Duncan* continue the 1969 volume's concern with models for causal analysis, which has become an important tool in the development of methodology itself, as well as in data analysis per se. The chapters on measurement, reliability, and validity are also of special interest, for, although nontechnical presentations of the measurement problem have occurred in sociology, relatively explicit technical papers have for the most part been absent from the literature.

COVERAGE

Prologue, Edgar F. Borgatta, George W. Bohrnstedt

PART ONE: THEORY BUILDING AND CAUSAL MODELS

Heise presents a model for making causal inferences from longitudinal data. The adequacy of the model is demonstrated by *Pelz* and *Lew*. These chapters will be important to those interested in panel data, since they point out the assumptions required for valid causal assertions, and, importantly the effects of violating these assumptions.

Duncan opposes the implicit assumption in recent sociological discussion that the objective of a piece of research is best served by a partitioning of the "explained variance" or by the calculation of a partial correlation. He argues, to the contrary, that achieving an algebraically consistent partitioning or system of partialing is secondary in importance to setting up an appropriate representation (or model) of the structure of the problem. *Bailey* reviews recent sociological literature addressed to building theories and then develops a set of criteria for evaluating axiomatic theory which differ from some of those stated by others.

1. *Causal Inference from Panel Data* David R. Heise
2. *Heise's Causal Model Applied* Donald C. Pelz, Robert A. Lew

3. *Partials, Partitions, and Paths* Otis Dudley Duncan
4. *Evaluating Axiomatic Theories* Kenneth D. Bailey

PART TWO: MEASUREMENT, RELIABILITY, AND VALIDITY

Blalock, Wells, and Carter show that inferences in regression analysis are biased in the presence of error. They then indicate how, using a single indicator, one can develop several differing estimating procedures. *Heise and Bohrnstedt* address themselves differently to the problem of measurement in that they assume one has multiple indicators of an unmeasured variable. Then, using factor and path analysis, they show how the validity, invalidity, and reliability of a composite measure based on the various indicators can be ascertained.

While measurement error can affect estimates of parameters, *Cleary, Linn, and Walster* show very convincingly that the power of statistical tests also is affected by the reliability and validity of one's measure. In addition to knowing about reliability of measures, one also needs to be concerned about the reliability of coders or rates in social science research. A number of seemingly dissimilar coefficients have been derived over the years for assessing inter-rater reliability. *Krippendorff* demonstrates that they can be derived from one general form under different sets of assumptions.

An important technique for the validation of one's measures has been the multitrait-multimethod matrix. *Althauser and Heberlein* use a causal model to show several problems which need to be overcome if the matrix is to be used for assessing validity. *Summers, Seiler, and Wiley* provide an example showing the use of the multitrait-multimethod matrix in validating the reputational method of assessing leadership.

5. *Statistical Estimation with Random Measurement Error* H.M. Blalock, Caryll S. Wells, Lewis F. Carter
6. *Validity, Invalidity, and Reliability* David R. Heise, George W. Bohrnstedt
7. *Effect of Reliability and Validity on Power of Statistical Tests* T. Anne Cleary, Robert L. Linn, G. William Walster
8. *Bivariate Agreement Coefficients for Reliability of Data* Klaus Krippendorff
9. *Validity and the Multitrait-Multimethod Matrix* Robert P. Althauser, Thomas A. Heberlein
10. *Validation of Reputational Leadership by the Multitrait-Multimethod Matrix* Gene F. Summers, Lauren H. Seiler, Glenn Wiley

PART THREE: STATISTICAL TECHNIQUES

Iversen provides a readable introduction to an important branch of statistics which sociologists have largely ignored—Bayesian statistics. *Entwistle and Knepp* provide an introduction to what may prove to be another valuable technique for sociol-

ogists—uncertainty analysis. This class of measures designs one attribute on another (sociation) comparable regression analysis.

Walster and Cleary show how to use statistical significance tests to make a decision, a method that does not exist between the degrees of freedom and the probability of a false null hypothesis. The authors show some of the established methods for hypothesis testing.

11. *Statistics According to Iversen*
12. *Uncertainty Analysis of Data* Doris R. Entwistle
13. *Multivariate Analysis* James S. Coleman

November 1970 LC

The 1969 yearbook was perhaps the most important in the history of the field. The 1970 yearbook continues this trend, with a special emphasis on the area of causal analysis. The attention it receives is reflected in the number of papers presented on this topic. The reader will find many important methodological contributions here, some of which may be regarded as breakthroughs in the field.

Prologue Edgar F. Borgatta

PART ONE: PATH ANALYSIS AND INFERRENCES, MEASUREMENT

Land provides a readable introduction to the development of the principle of path analysis. *Althauser and Heberlein* discuss the assumptions involved in causal analysis and how to test them. *Duncan* presents a useful technique for analyzing data that shows the relationships between variables such as education, work experience, and choice. This chapter also provides a good introduction of determining the presence of unmeasured variables. *Heise* addresses some problems in causal analysis, particularly change, exploring the implications of causal models.

1. *Principles of Path Analysis* Robert P. Althauser
2. *Problems in Path Analysis* David R. Heise
3. *Contingencies in Path Analysis* Otis Dudley Duncan
4. *Observations on Path Analysis* George W. Bohrnstedt

PART TWO: STATISTICAL TECHNIQUES

Dobry examines the Bayesian approach to scientific examination of hypotheses. *Entwistle and Knepp* provide an introduction to what may prove to be another valuable technique for sociol-

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ologists—uncertainty analysis. *Coleman* develops a class of measures designed to show the effect of one attribute on another (as opposed to mere association) comparable to regression coefficients in regression analysis.

Walster and *Cleary* argue that, for a researcher to use statistical significance as a mechanism for making a decision, a meaningful relationship must exist between the degree to which a hypothesis is false and the probability of observing significance. The authors show such a relationship can be established for hypotheses about means.

11. *Statistics According to Bayes* Gudmund R. Iversen
12. *Uncertainty Analysis Applied to Sociological Data* Doris R. Entwistle, Dennis Knepp
13. *Multivariate Analysis for Attribute Data* James S. Coleman

14. *Statistical Significance as a Decision Rule* G. William Walster, T. Anne Cleary

PART FOUR: MATHEMATICAL SOCIOLOGY

Land provides a mathematical formulation of Durkheim's theory of the division of labor, illustrating the interplay of the dual processes of theoretical specification and parameter estimation. *Fararo* places the setting for and the analysis of problems of equilibrium of statuses within a unified mathematical framework. *Anderson* offers a nonmetric multidimensional scaling analysis of assumptions in the semantic differential.

15. *Mathematical Formalization of Durkheim's Theory of Division of Labor* Kenneth C. Land
16. *Status Dynamics* Thomas J. Fararo
17. *Structure of Semantic Space* Andy B. Anderson

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SOCIOLOGICAL METHODOLOGY 1969

The 1969 yearbook spans many areas of methodological importance. Causal inference is the area perhaps most crucial now to sociologists and the attention it receives in this book is weighted accordingly. The reader will find the most current important methodological developments, and some may regard each of them as the "breakthrough" they have been waiting for.

COVERAGE

Prologue Edgar F. Borgatta

PART ONE: PATH ANALYSIS, CAUSAL INFERENCES, MEASUREMENT OF CHANGE

Land provides a readable "how-to-do-it" treatment of the principles of path analysis. *Heise* details the assumptions underlying the models used in causal analysis and offers several warnings about them. *Duncan* presents an application of path analysis that shows the relationships among background variables such as father's occupation and education, work orientation, and occupational choice. This chapter is important for its explanation of determining causal relationships in the presence of unmeasured variables. *Bohrnstedt* addresses some problems in the measurement of change, exploring the handling of dynamic relationships.

1. *Principles of Path Analysis* Kenneth C. Land
2. *Problems in Path Analysis and Causal Inference Data* David R. Heise
3. *Contingencies in Constructing Causal Models* Otis Dudley Duncan
4. *Observations on the Measurement of Change* George W. Bohrnstedt

PART TWO: GENERAL PAPERS

Doby examines the logic and levels of scientific examination: are the differences in the methodology of the natural and social sciences

inherent in the sciences themselves? *Cartwright* explores, compares, contrasts, and places in the context of related concepts the various meanings of "ecological variables." His chapter deals with the scope of human ecology, the methodological issues surrounding ecological variables, and the logical problems of inferences from group correlations to the individual. *Schuessler* contends that a statistical tool that has potentially great utility for sociologists has been largely ignored: the analysis of covariance. He begins with a general exposition of covariance analysis and then demonstrates how a number of the workaday methodologies that sociologists employ can be recast in a framework of covariance analysis. *Fararo* offers a useful introduction to mathematical model building.

5. *Logic and Levels of Scientific Explanation* John T. Doby
6. *Ecological Variables* Desmond S. Cartwright
7. *Covariance Analysis in Sociological Research* Karl Schuessler
8. *Stochastic Processes* Thomas J. Fararo

PART THREE: SHORTER PAPERS AND NOTES

Ofshe and *Anderson* investigate the method of paired comparisons and *Hadden* illustrates the problems of using ad hoc definitions. Finally, *Morrison* discusses the derivation of age- and duration-specific probabilities from a longitudinal record.

9. *Testing a Measurement Model* Richard Ofshe, Ronald E. Anderson
10. *Use of Ad Hoc Definitions* Jefferey K. Hadden
11. *Probabilities from Longitudinal Records* Peter A. Morrison

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